**So where might the struggles be and what will bring them to your attention so you can deal with them?**

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| Misconception | What could expose the misconception |
| **Kids may not realize that the diagram above shows both 2/5 and 3/5 (and 5/5).**    *This is because there is too much emphasis on the shaded part instead of listing all fractions in a situation.* | **You might ask kids to describe all the fractions they see in a given situation.**  e.g.   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  | |  |  |  |  |  |  |   Open question: Create a model or draw a picture that shows both 1/6 and 5/6 at the same time. |
| **Kids do not believe that 1/3 of the blocks are red.**    *This is because the focus is always on area. Notice we say “fraction of the blocks” not just fraction”.* | **It is good, not bad, to use materials that are usually used for a different model.**  e.g. Provide red, yellow, green and blue pattern blocks. Ask for a student to show ½, then 1/3, then 1/6 and then ¼. |
| **Kids might think that 1/3 is always less than 1/2 but it depends on the wholes being equal.**  **Kids might think that 1/3 is more than 1/2 since 3 is more than 2.** | K says 1/3 is less than ½ since 3 is more than 2.  L says 1/3 is more than ½ since 3 is more than 2.  J says 1/3 could be more or less than ½. It depends.  With whom do you agree? Why? |
| **They might not realize why it’s hard to compare 2/5 and 3/8 without pictures and/or objects but it’s easy to compare 2 anythingths with 5 anythingths without seeing them.** | Open question: Which pairs of fractions would you find easiest to compare? Why?  5/12 5/43 4/9 7/9 |
| **Kids might have difficulty comparing to 1/2 if the fractions are not simple; for example, they know that 3/8 < ½ but not that 99/200 is also < ½.**  *This is because students do not get enough practice with anything but standard fractions.* | Possible open question: A fraction is super close to ½. What might it be? |

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| **Kids might assume that 6/10 > ¾ since each part of the first fraction is greater than the corresponding part of the other.** | Why is 40/100 < 2/3 even though 40 and 100 are more than 2 and 3?  Possible open question: One fraction has a greater numerator and a greater denominator than another, but it’s still smaller. What could the two fractions be? |
| **Kids may not realize that to decide what this picture represents, you need to know the whole.** | Why might someone call this ¾ but someone might call it 1 ½? |
| **Kids may not understand why a/b = a ÷ b when a is not 1.**  *We often do not really explain this, but expect students to just accept it.* | Ask students to figure out how much you would get in each situation:    4 people sharing 2 items  3 people sharing 2 items  5 people sharing 3 items  Then have students figure out what they notice.  At a higher grade, ask why 5x/2 might mean 5x shared into 2 parts(division) or 5/2 of an x as taking an x and drawing 2 ½ of them. |
| **Students might not have any sense of the answer when you divide fractions since they don’t know what dividing means.**  One reason might be the way we read calculations.  We could read 2 ÷ 1/3 as how many 1/3s are in 2 instead of as 2 divided by 1/3. | Possible open question: You divide two fractions and the answer is just a little more than 2. What could the fractions have been? |
| **Students struggle with adding fractions vs. adding ratios.**  **For example, ½ + ½ ≠ 2/4 but 1 out of 2 one day and 1 out of 2 the other day is 2 out of 4 on both days.**  *The issue is that in one situation, you are adding parts of the same whole and in the other situation you are putting together parts of different wholes.* | Ask students why if it rains 2 days one week and 3 days another, you would say it rained 5/14 of the days, but that 2/7 + 3/7 = 5/7 and not 5/14. |